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INTRODUCTORY LECTURE

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TO THE

COURSE ON BOTANY,

DELIVERED BEFORE THE

STUDENTS OF ARTS AND MEDICINE, MCGILL COLLEGE,
SESSION, 1857.

BY

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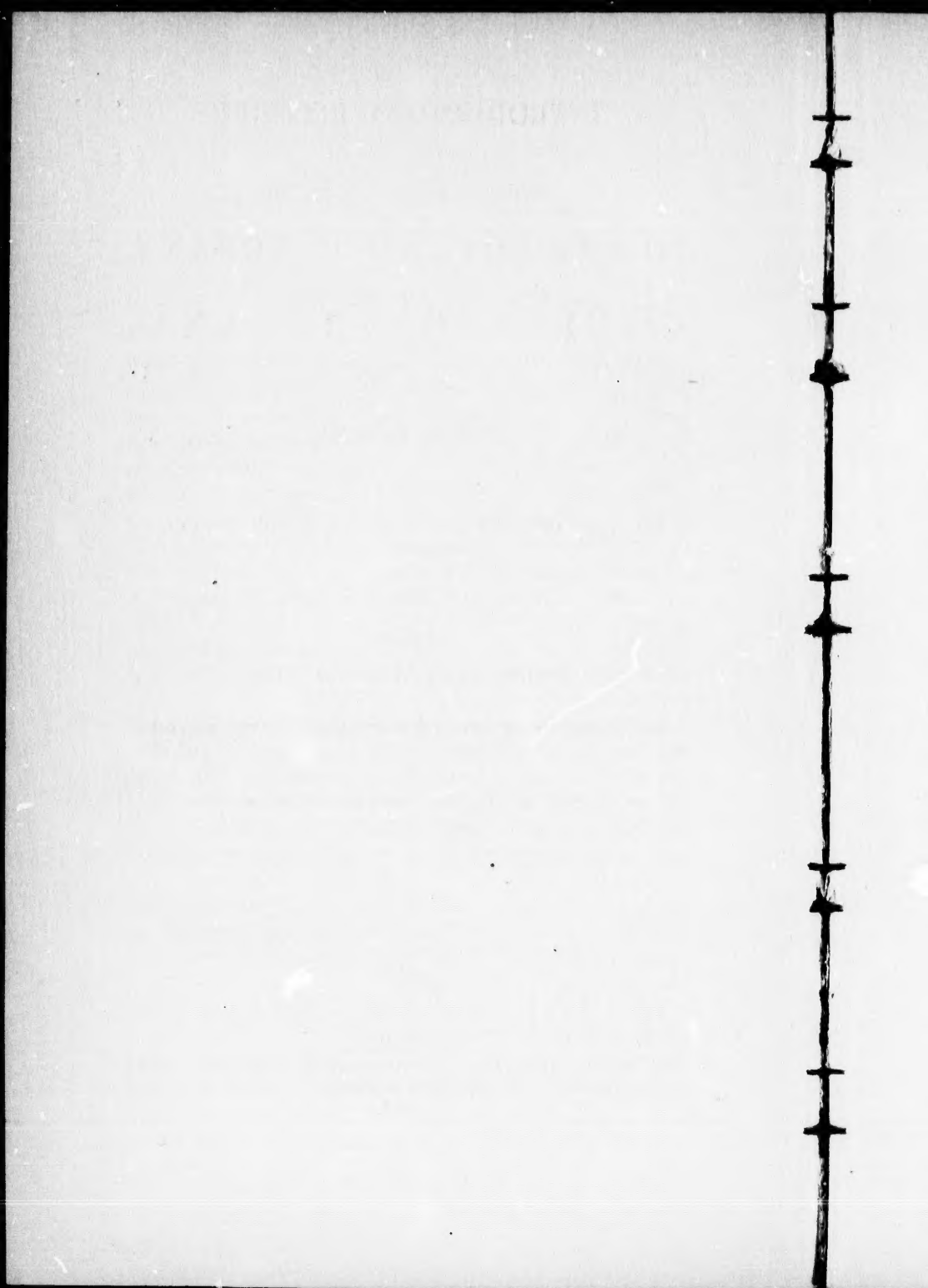
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1857.



INTRODUCTORY LECTURE  
TO THE COURSE OF BOTANY,

McGILL COLLEGE, MONTREAL.

GENTLEMEN,—The course of Lectures on Botany upon which we are about to enter, is authorised to be delivered in connexion with the Lectures on general Natural History, under the auspices of the Principal of this University. Being called upon to perform the responsible office of instructing you in this department of Science, there are considerations that prompt me to offer one or two suggestions for approval, which will serve to ameliorate the austerity of the circumstances under which we meet. You can readily conceive the difficulties under which a teacher usually labours, who is brought for the first time in presence of a class of intelligent Students—the unpleasant tax upon his nervous modesty, the severe trial of his mental and physical energies, accompanied by an inward consciousness of his possible inability to perform satisfactorily the duties before him.

The consciousness of such difficulties generally implants a desire in the teacher to meet faithfully the requirements of his office, employing both time and labour in their fulfilment. The sincere and candid acknowledgment of them may, therefore, be received as a direct apology for such inefficiencies as may become apparent. Under such circumstances, it is becoming in the hearer to overlook the infirmity and extend the indulgence required. It is not for me to demand of you more than necessity requires. That necessity, however, is great, and will compel me throughout the course to draw largely upon your indulgence and patient attention, which I now crave at your hands.

Relying then upon your generous forbearance, it will be my endeavour to fulfil, to the best of my ability, the purposes for which these lectures are intended, namely, to bring prominently before you the beauties and perfection of nature, as exhibited in that

portion of God's creation—the vegetable kingdom—to sketch out to you the philosophy of the plant in its structural and physiological aspects, to systematise the varied productions of the earth's surface upon principles derived from an actual study of nature's laws and manifestations, and to adapt the knowledge which botanical science imparts to the true interests of man. In pursuance of these objects, it will be my duty to enter into the minute details of plants, in reference to their structures, functions, chemical composition and natural relations, and show you the value of such scientific knowledge in its application to medicine, horticulture and agriculture.

In a youthful and growing country like this, there is usually a tendency to undervalue a science which apparently cannot promise results of a practical and useful character. The advantages to be derived from a cultivation of scientific knowledge are scarcely recognised in comparison to the supposed greater benefits of an early acquaintance with the grand material object of man's temporal existence. We are all aware that it has been through no ordinary difficulties that we have attained the position we now hold; first, as a community desirous of supporting literary and scientific institutions, and secondly, as a University, whose great aim is the thorough education of the student in matters which will best serve his interests, as an accomplished and useful member of Society. If such have been the difficulties of the past, how much greater now should be the vigour—how much stronger the animus—prompting us to maintain the value and importance of the University in which we labour, as students and professors, to study with spirit and assiduity while within its sacred walls, in order to attain that knowledge which will refine the mind, enrich the intelligence, and entitle us to honor and preferment.

It is difficult at first to estimate the value of a science like Zoology, Geology or Botany and how far the study of the one or the other may bear upon intellectual improvement or general success in life. It is this primary difficulty that forms the great drawback to the more general acquisition of scientific knowledge. It is moreover too often considered that the study of science is an arduous task—one that burdens the head with hard and inexplicable names as well as

many useless and may be questionable theories and dogmas. It is much to be regretted that an error of this kind should prevail so universally, since it places science in a false position and prevents the student from attempting what he believes to be a laborious undertaking, and one of little utility, even were he to prosecute his studies and researches successfully. There is but one method of relieving the doubts and difficulties that here harass the youthful mind—it is, to search and receive the testimony of those who have been in their day active and diligent students of nature, acute observers of its laws and manifestations and faithful interpreters of its great truths. The history of such men furnishes ample evidence that there is in science an influence for good, a power within it to improve the quality of the mind and in some measure to regulate human action. In its study there are brought into play, in an eminent degree, such powers and qualities as those of observation, comparison and judgment, which may be at first feeble, but they are gradually increased in vigour and acuteness and at length perfected under the beneficial influence of a well regulated and methodical training. The development of such qualities gives precision and force to the thoughts and actions, and their application to the ordinary pursuits of life renders one more capable of meeting its necessities and overcoming its difficulties. When we observe the advantages of a well-regulated mind, we cannot ignore the importance of those studies, whose tendency is to perfect the qualifications necessary for the successful prosecution of an active business or profession. The most marked facilities are now given in this University for the attainment of scientific knowledge, because it is felt that such a course will raise the standard of general education, open up a new field for the active operations of the youthful mind and give to those of the community, who value their own mental improvement, such instructive information as will tend to elevate their tastes, refine their qualities of mind, and extend the range of their sympathies beyond the contracted limits of a business life. It is within the reach of all, to partake of these advantages and derive benefit from those efforts which have successfully terminated in the institution of special courses of instruction on the most important departments of Natural History.

To the student who is undergoing a regular course of collegiate education, the sciences of Natural History possess interest of considerable value. They form, as it were, a sister-alliance with his strictly professional studies and, as an adjunct to the latter, contribute materially to the health of his mind. We admit, it is of paramount importance that professional students should be thoroughly educated in the science and literature of their respective professions, a perfect knowledge of which is essential to their callings. But while granting this, we would not hesitate to employ means for the occasional diversion of the mind, by turning the thoughts into channels, giving a wider range for the occupation, improvement and gratification of the senses, the feelings and the imagination. It would thus be in our power to counteract the tendency of an education purely professional, a tendency too apparent, but rarely acknowledged ere it be too late to remedy. And what is this tendency? "To limit the range of mental vision," is the expressive language of one who stood pre-eminent in science, the late Professor Forbes, for, said he, "were the sciences so infused to be entirely professional, we should warp and contract the mind, the tonic would be too strong, would not invigorate but corrugate."

These remarks are applicable to students of all professions, but it is particularly to the student of medicine that the Natural History sciences prove of so much practical value. The necessity and importance of admixing them with his professional studies is an opinion now firmly established, and of the advantages there can be no question. To quote the words of the late Sir George Ballingall, "it is indispensable to any man who aspires to the elevated rank of a Physician." But I cannot do better here than give the testimony of the able authority, (Forbes) previously mentioned, who spoke thus;—"We can most beneficially counteract the natural tendency of purely professional studies, through the collateral sciences, which are sufficiently allied to the professional ones to prevent an undue dissipation of the students' thoughts, and at the same time are sufficiently different to give them a wider sphere of action. It is in this point of view, that we should regard the Natural History sciences as branches of



medical education. For my own part, after much intercourse with medical men, who had studied at many seats of professional education, some collegiate, some exclusively professional, I have no hesitation in saying that, as a rule, the former had the intellectual advantage. There are noble and notable exceptions, old and young, but the rule is true in the main. The man who has studied in a seat of learning, a college or university, has a wider range of sympathies, a more philosophical tone of mind and a higher estimate of the objects of intellectual ambition, than his fellow-practitioner, who, from his youth upwards, had concentrated his thoughts upon the contractedly professional subjects of an hospital school. . . . There are not a few, too (medical men) who may some day find themselves isolated in distant and little-explored regions. Far away from friends and the conversation of intellectual companions, any pursuit that can engage and occupy the mind and above all satisfy its thirst for truth by draughts from the pure and refreshing fountains of nature—any such pursuit becomes a blessing and converts the desert into a paradise, one often filled with creatures yet to be named. How delightful does it then become to be able to recall the lessons of our student-days, and casting away regret and languor, invigorate our minds by the practice of healthy intellectual exercise."

In conjunction with such testimony, it will suffice to add that every Medical University, particularly in Britain and on the Continent, that professes to furnish an extended education to its students, not only gives every encouragement and facility for the study of the collateral sciences, as they are called, but the curriculum in each demands imperatively a regular course of instruction in these sciences by qualified teachers or professors, and the subjection of candidates to examination in order to ascertain whether they possess a fair and competent knowledge of them, before receiving their Diplomas. Two courses, one upon Zoology, the other upon Botany, have been prescribed by this University to the student of medicine during his collegiate career, and from the remarks that have been already made in reference to the subject, you will at once discern the laudable motives that have actuated those in authority, in extending your curriculum of study. While

it will be to the honor of the University, it is but simple justice to the student and graduate, who will thus find himself prepared, as occasion may require, to meet the demands of other Universities and of every Board of Examination, and ultimately to fulfil his obligations, whether in a civil or military capacity, with credit to himself and the *Alma Mater* from which he hails.

I have thus, gentlemen, laid before you the highest considerations in favor of the prosecution of scientific study, and confessedly with the desire of urging upon you the necessity of weighing them fully, now that you are about to enter upon a course of instruction in that special branch of Natural History, to which I shall have the honor of directing your attention. You will find that the more you are influenced by these considerations, the greater will be your zeal and assiduity, and the more successful will be your efforts to attain a sufficiency of knowledge to gratify the present and enable you to improve the future. Your interest will be excited, as the science of Botany becomes gradually developed, as the grand operations of nature are disclosed and the beautiful phenomena of vegetable life portrayed. The value of the science, in a practical point of view, will be properly estimated as you become acquainted with the economy of plants, their nutritious and medicinal properties, the conditions of soil and climate under which they grow, their capability of special improvement in quality and more especially their adaptation to human interests,—man's life, comfort and happiness.

It is usual, in an introductory lecture, to give a short sketch of the history of the subject that is to engage the attention of the student. I would be unwilling to adopt this course, were it not that the history of Botany furnishes ample evidence of its cultivation, even from an early period, as a practical science, and of the utility of its knowledge in the advancement of the arts, and particularly of Medicine, in the improvement of agricultural operations and the attainment of a more perfect system of gardening. As this evidence of the past will be probably more convincing than any arguments I can here adduce, I propose relating to you a few leading points of botanical history, that seem to me to be of value and importance for the present purpose.



Without entering into any speculations upon the probable amount of knowledge possessed by man, at the earliest period of the world's history, of the nutritious qualities and medicinal properties of plants and the various uses to which they may have been applied, a subject replete with interest, I will date my remarks from a period when we first observe Botany cultivated as a science.

We find the first evidences of botanical study and research among the philosophers of ancient Greece. They devoted themselves principally to the digging of roots and the finding of herbs, in order to advance the arts and particularly medicine. They were elegantly styled *Rhizomata*, (wood-cutters) and not unfrequently nick-named *Pharmacopola*, (barterers of medicine or druggists.) They were also called *Cultivators of Physics*. This latter title was somewhat appropriate, for it was not so much the naming and classifying of plants they studied, but their aim was an explanation of their phenomena and their employment as physical substances in arts and trades. The great philosopher Aristotle is reckoned with justice, the first cultivator of the natural science of Plants. He collected and described many medicinal plants, but his genuine works are supposed to have been lost. His favorite disciple, however, the eloquent Theophrastus imbibed the principles and improved upon the information of his great teacher. In his History of Plants, he exhibits deep reasoning and furnishes evidence of his constant and excellent observations of the phenomena of the vegetable world. Theophrastus was also the first who kept a garden for plants, and in his legacy he named some of his scholars as keepers of this property. Immediately after his time, the science of nature lapsed into comparative obscurity till the subjugation of Greece by the Romans, who, acting upon the knowledge imparted to them by the conquered, applied it to rural economy, horticulture and agriculture. It was in the middle of the first century of our era that flourished the most celebrated of writers on ancient Botany. This was Pedacius Dioscorides of Anazarbus in Silicia, a renowned physician who followed the Roman armies in their expeditions throughout the Empire. In his *Materia Medica*, he enumerates all the medici-

nal plants then known, describes their characters and properties, and gives proofs of their efficacy in diseases. This work held universal sway in the schools for more than 1500 years, as the only fountain of all knowledge relating to Natural History and particularly of botanical information. To him succeeded Caius Plinius Secundus, known as the elder Pliny, who left lasting memorials of his great learning in his "Summary of all Science, Knowledge and Arts." He also added to the list of known plants. A dark cloud again brooded over the science of Botany. Its study was for a long period forgotten or neglected by the Romans. It would seem that during the darkness of the middle ages up to the thirteenth century, the Arabians, who derived their knowledge entirely from Dioscorides through a distorted translation of his work, were the only nation who applied themselves diligently to the study of medicinal plants; and they were enabled to become acquainted with many remarkable oriental plants through the flourishing trade they carried on for centuries from Madeira to China. It was towards and during the 15th century that a new light dawned over free Italy. Science and Art received an impetus under the spirited influence of rivalry. Dioscorides and Pliny were then taken from the mouldy shelves and studied in the original as pure fountains of botanical knowledge. But it is to the German fathers, schoolmasters and professors of the 16th century, that we look for the first natural exposition of Botany. Among the most learned of these was Gesner, a physician and professor at Zurich, who died in 1564. Besides possessing the merit of being an extensive collector of plants, he described them, gave designs, wood-cuts, and copper-plates, especially of foreign plants, and was the first to draw attention to the important parts of fructification. Lobelius, also, of Flanders, who was afterwards superintendent of the garden of Queen Elizabeth of England, besides his many discoveries, made the first attempt to arrange plants according to a certain natural affinity. Great zeal and diligence were now displayed in the advancement of the arts and sciences and Botany flourished in every country. It had its advocates in Germany, France, Italy, Portugal and Spain, and the discovery of America enlarged the field of research. Can it be wondered then,

that under these circumstances, there was urgent necessity of becoming acquainted with the anatomy and structure of plants in order to their systematic arrangement and classification. These investigations were carried on under the auspices of the Society of London for the promotion of Science, which was liberally supported by Charles II. The discoveries of Grew, Secretary to the society, are recorded in the immortal work, the *Anatomy of Plants*, published in London in 1682, in which is found the doctrine of the two-fold sex of plants. The same Society published the excellent and peculiar investigations of Malpighi of Bologna. It was the influence of such investigations that gave birth to the classification of plants according to a natural method. In the beginning of the 18th century, appeared the works of Morison, a Scotchman, and of the celebrated John Ray, an English clergyman, who travelled for many years through all Europe and published his *Methodus Plantarum Emendata*, which gives the principles whereby genera and species should be distinguished, and contains the elements of a natural system, based upon a study of all the parts of the plant. He was followed by Herman and Boerhaave of Leyden, but there was also laid the foundation of the artificial system—one entirely opposed to the former, and which was soon to eclipse its rival. Rivinius, professor at Leipzig, constituted the corolla, the most important part for the division and classification of plants, and in the promulgation of this doctrine, he was materially assisted by the distinguished French botanist, Joseph Pitton de Tournefort. It was at this time, the beginning of the 18th century, when botanical gardens flourished in Italy, Germany, France and England, (among which may be mentioned the celebrated gardens at Amsterdam in the Netherlands, and at Bologna in Italy, the Royal Garden in Paris, the Royal Garden at Hampton Court, near London,) when native Floras were objects of careful investigation, and when the knowledge of exotic plants of foreign climes was vastly extended by travellers and well-informed naturalists,—it was at this time that Sweden gave birth to one of the most remarkable men in the history of Natural Science, Charles Linnæus, who was born in 1707. To him is Natural History, in all its branches, especially indebted, as the founder of the historical part.

He possessed a peculiar relish for Botany, and his writings and works give evidence of his unwearied labours and devotion to the cause of botanical science. He established an artificial nomenclature, gave specific characters to plants, arranged them into genera and formed a gigantic system of artificial classification, in which high value is put upon the stamens and pistil, and upon the corolla. Into the merits of this system we shall hereafter have occasion to enter. Let me merely observe here, that despite the declamations of the promoters of the natural method of classification, who either greatly undervalue or entirely reject the Linnæan system, it stands not merely the historical monument of past genius, but forms a simple key to the naming of plants, and an essential preliminary to the understanding of the intricacies of natural classification. During his own time, Linnæus met with much opposition both in Germany by Haller and the followers of Rivinius, and in France by the disciples of Tournefort, and by Bernhard Jussieu. Other theories and systems were also started and had their supporters. But their influence was merely temporary, and all gave way before the simple and fascinating system of Linnæus.

In process of time, while herbaria were enriched with numerous new plants and systematic works written in Linnæan order, the elementary structure and physiology of plants were more minutely studied, the organs of reproduction were better examined and due attention was paid to the essential products of vegetation—the fruit and seed. In consequence, the science made rapid advances and resulted in the construction of a natural method and arrangement of plants. France, Germany and Italy vied with each other in discoveries. The botanist of the present day is familiar with the names of Lorentzo Jussieu, Augustus Pyramus Decandolle, Mirbel, Rudolphi and Treviranus, whose works on structural botany and natural systems were published at the beginning of the present century. Since that period, botany has made rapid strides. The natural systems of Jussieu and Decandolle have been materially improved by Endlicher, and more especially by Lindley in his elaborate work entitled “The Vegetable Kingdom.” The various interesting researches of Gaudichaud, Schleiden, Mohl, Brown, Amici, Griffith, Schultz and others, have in a measure completed

our knowledge of the structure and functions of the different parts and organs of plants and of their alliances and affinities; while the labours of Liebig, Mülder and Johnston on the chemistry of plants have tended to the application of botanical science to the interests of agriculture and horticulture, at the same time that others as Christison, Royle, Burnett and Lindley, have supplied valuable data in reference to their medicinal properties and diatetic uses. Not less important and interesting have been the researches and observations, both practical and speculative, made in reference to the geographical distribution of plants over the globe as well as regarding those plants which existed on the earth in its primæval state and which now lie as monuments of vanished forms of vegetable life, buried in the vast geological epochs that elapsed before the establishment of the present order of things.

And what has been the ultimate effect of this? Why, it has raised the standard of botany to the high rank it should hold—rivalling, if not excelling its sister sciences—and has established it within schools and universities as one of the most interesting, beautiful and useful of studies. It claims as its votaries a host of the most accomplished of minds and of the highest order of rank, and it now flourishes in all countries and in every clime. And why should Canada rest satisfied—now that she is interesting herself in the subject of schools and colleges—till she has established these as nurseries of science as well as of arts and literature—nurseries that will rear up youths of talent and ability, to be hereafter claimed as lasting monuments of honor and credit to the country.

You will perceive, from the short sketch just given you, that the tendency of scientific investigations, has been to reduce to practical and useful ends the knowledge acquired by research, and that the spirit of enquiry, however exclusively scientific, has generally subserved in some way one or more of the special interests of man. It will be my anxious desire, in the present course of lectures, to give you a faithful representation of botanical science in its present advanced state, and place prominently before you such important facts and considerations as bear specially on medicine, agriculture and horticulture. I have no doubt you will ere long become interested in the subject and it will give me pleasure to furnish you

with such information as you may occasionally require, and such facilities for the prosecution of the study as may be within my power. The deeper your study of the operations and phenomena of nature, the more intimate your acquaintance with the structures and functions of the plant, the greater will be the pleasure and gratification you will experience and the more profound will be your admiration of this portion of God's creation. With a knowledge of botanical science, you cannot but take delight hereafter in the contemplation of those beautiful and varied objects of nature that will constantly meet your eye, and if you study them as living organizations as well as the manifestations of life they exhibit and the laws which govern them—if you study such phenomena in the true spirit of wisdom, they will subserve a better and higher purpose than the mere gratification of the mind. They will enrich it with pure and lofty thoughts and raise your souls in admiring contemplation of Him, at whose fiat, at the beginning, "the earth brought forth grass, the herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind," and can we ignore the beauty and perfection of the plant, when it is recorded in the same breath, that "God saw that it was good."

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